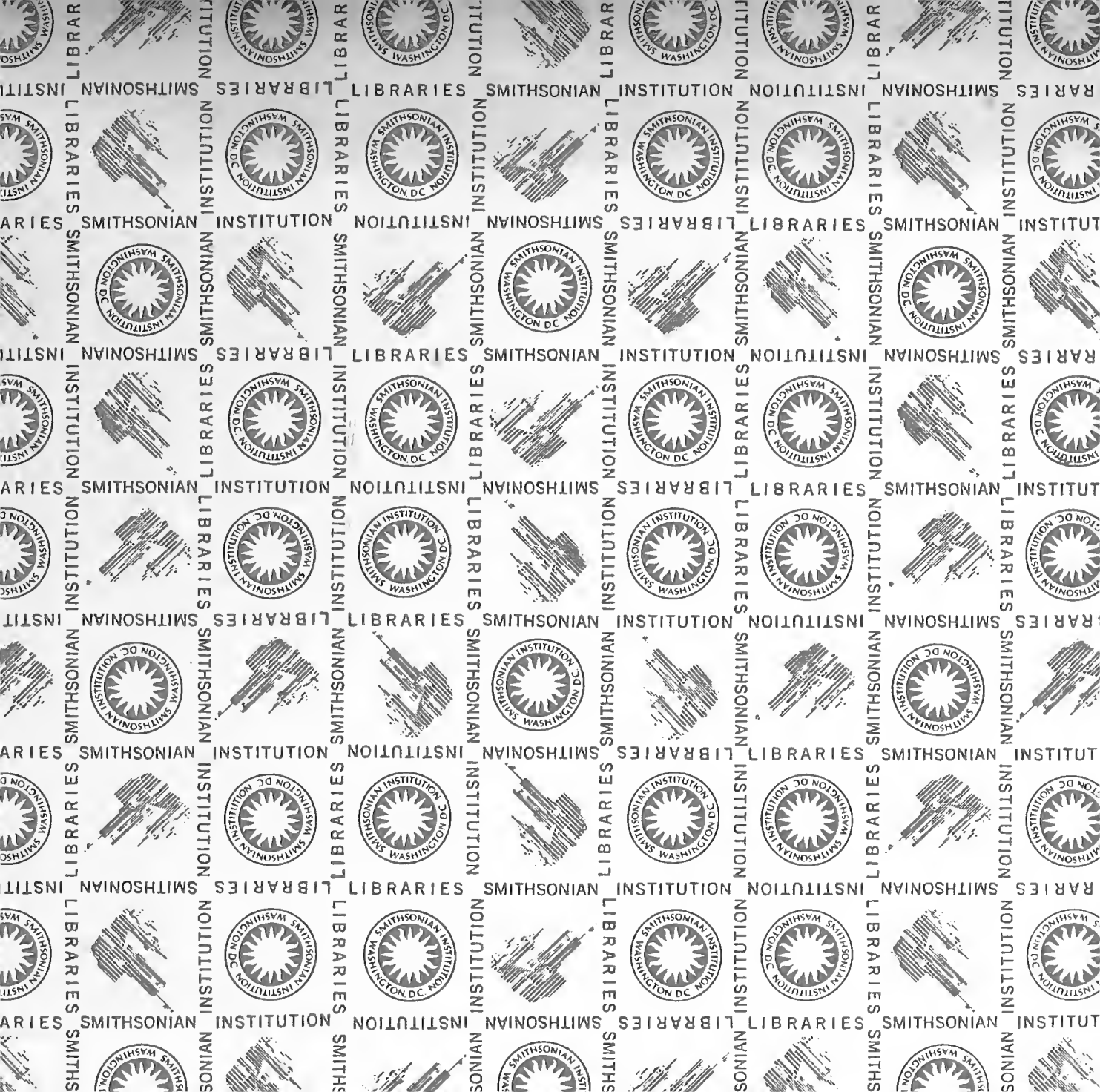
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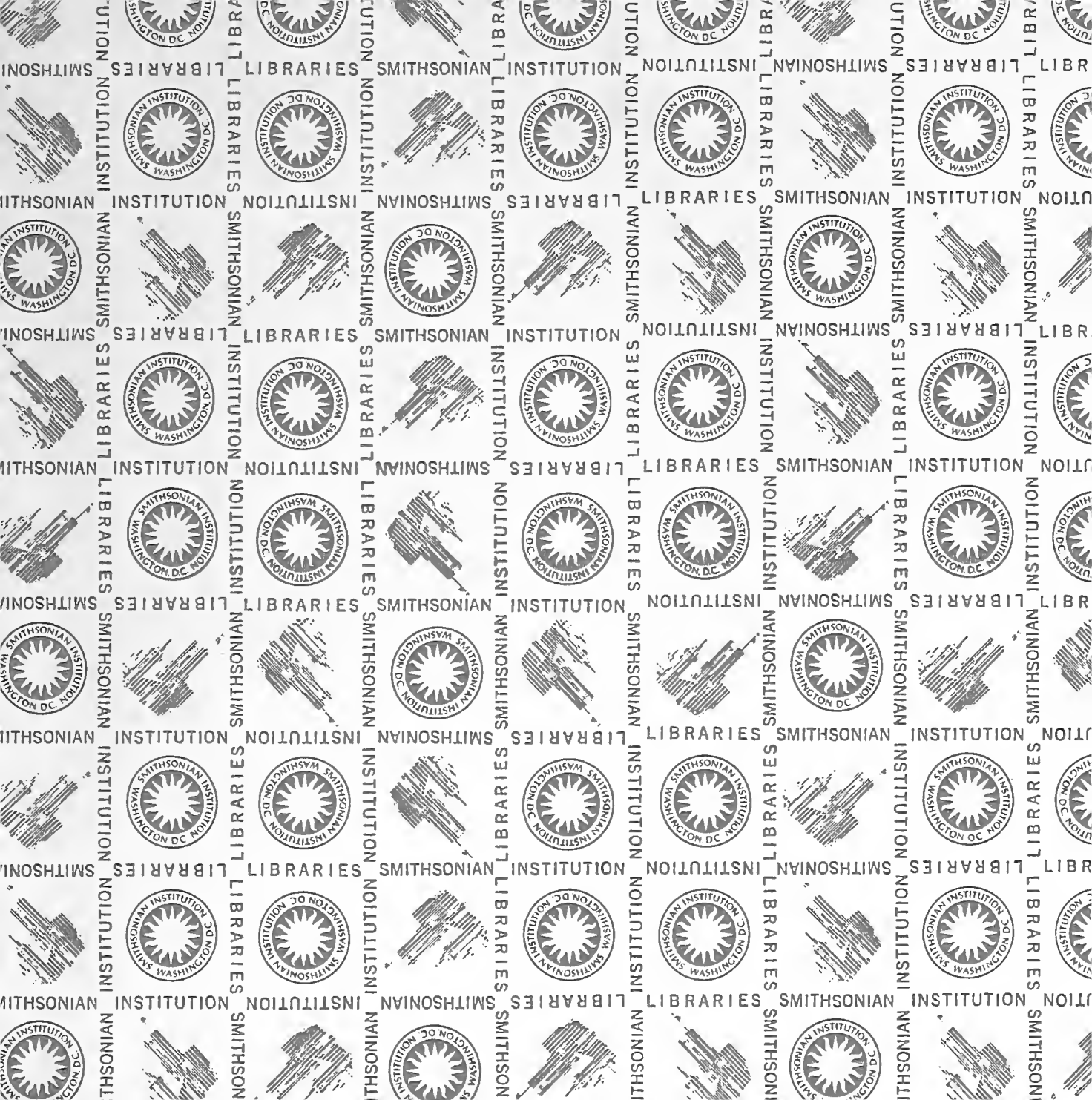
SMITHSONIAN INSTITUTION LIBRARIES

PRINTED TEXTILES 1760–1860

in the Collection of the Cooper-Hewitt Museum

The Smithsonian Institution's National Museum of Design

PRINTED TEXTILES 1760-1860

in the Collection of
the Cooper-Hewitt
Museum

The Smithsonian
Institution's National
Museum of Design

COVER

Roller-printed fabric
England, c. 1830
Plain-weave cotton
Height of repeat: 34.3 cm.
Gift of Harold M. Bailey
1960-79-32

INSIDE COVER

Block-printed fabric
Produced by Christophe-Philippe Oberkampf (1738–1815)
Jouy, France, late 18th century
Plain-weave cotton
Height of repeat: 22.8 cm.
Gift of Josephine Howell
1973-51-134

BACK COVER

Salesman's card
France, early 19th century
Plain-weave cottons on paper
71.8 × 49.5 cm.
Museum purchase
1986-19-1

Note: All dimensions are in centimeters, with height preceding width.

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Photographs by Scott Hyde
Design by Mentyka/Schlott
Typography by
Fine Composition, Inc.
Printing by
Water Street Press, Ltd.

FIGURE 1

Block for printing one corner of a handkerchief
Europe, early 19th century
Wood, metal, and felt
Gift of Eleanor and Sarah Hewitt
1931-71-24B

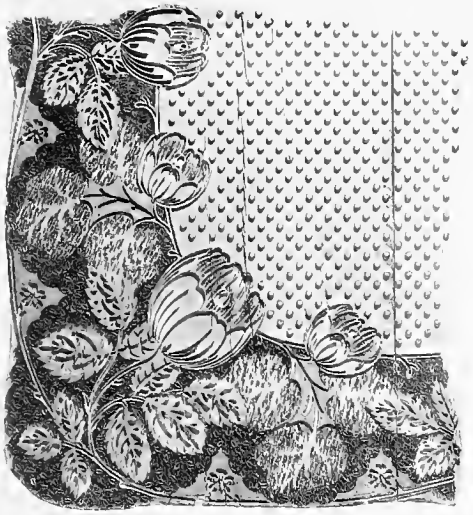
This block would have been turned four times to print the four corners of a handkerchief.

FOREWORD

*I*t seems fitting that this publication on printed textiles, and its accompanying exhibition, *Color by the Yard: Printed Fabric 1760–1860,* should mark the closing of the Museum's tenth anniversary year. A major portion of the Cooper-Hewitt's inaugural exhibition as the Smithsonian's National Museum of Design was devoted to cloth and its transformation into a myriad of designs. That exhibition clearly established the importance of textiles in human history. The Museum's collection of textiles is one of the finest in the world. It contains over thirty thousand examples from many geographic areas, spanning a period of more than two thousand years. The collection reflects an endless variety of patterns, including all types of fabrics and methods of manufacture, and it serves as a valuable resource for designers and scholars.

The collection has grown over the years through the generosity of many friends. J. P. Morgan was a major contributor, as were Richard Cranch Greenleaf, Marian Hague, and Josephine Howell. The Textile Department is most indebted, however, to the founders themselves. Eleanor and Amy Hewitt had a particular fondness for textiles and began collecting as young girls. *Color by the Yard* was made possible by support from the New York State Council on the Arts, Brunschwig & Fils, Inc., Laura Ashley, Inc., and J. P. Stevens & Co., Inc., to whom we are deeply indebted.

Lisa Taylor
Director Emeritus



INTRODUCTION

The use of carved blocks, metal stamps or seals, and colored pigments and resists to imprint motifs on cloth reaches back into early history. Today, however, the term *printed textiles* is generally applied only to those lengths of fabric on which an image has been printed in repeat with colorfast dyes, resists, or discharges by means of wooden blocks, engraved plates, or cylinders to create a washable, patterned textile. These practices became a part of the European textile industry during the seventeenth and eighteenth centuries.

Prior to the seventeenth century, Europeans printed on fabric using oil-based pigments or inks to produce cheaper and cruder versions of woven fabrics. It wasn't until the French, Dutch, and English East Indian trading companies brought back painted cloths from India that Europeans became enthusiastic about printed cottons. Indian painted cloths were lightweight and colorful, and the demand for these exotic imports grew rapidly. The Dutch, who were among the first to organize systematic trade with India, were also among the first Europeans to develop textile printing centers. By the seventeenth century, textile printing was practiced in several areas of Europe with varying degrees of success *(FIGURE 1)*.

Unfortunately, very little information is available about the early European printing firms. In France and England, where industrial centers for pattern-woven fabric were already well established, silk and wool manufacturers feared competition from printed textiles and agitated successfully for laws to suppress or curb the new industry. These laws and statutes, long since repealed, became a matter of public record and still exist in municipal archives where they can be consulted by historians. Ironically, in Switzerland, the Netherlands, and various German states where there was no suppression, history has proven more elusive.

A certain amount of confusion has been introduced into the efforts of modern researchers by the terminology employed to describe textiles during the seventeenth and eighteenth centuries. French records, for example, use the words *toile peinte* and *indienne* to refer both to imported, painted Indian cloth and to domestically produced, printed textiles. Similar confusion exists in English records in which painted cloth imported from India and domestically printed cottons may both be called chintz or calico.

Cotton cloth was used for the painted fabrics that had initiated the fashion for printed cloth, and it became the fabric of choice for

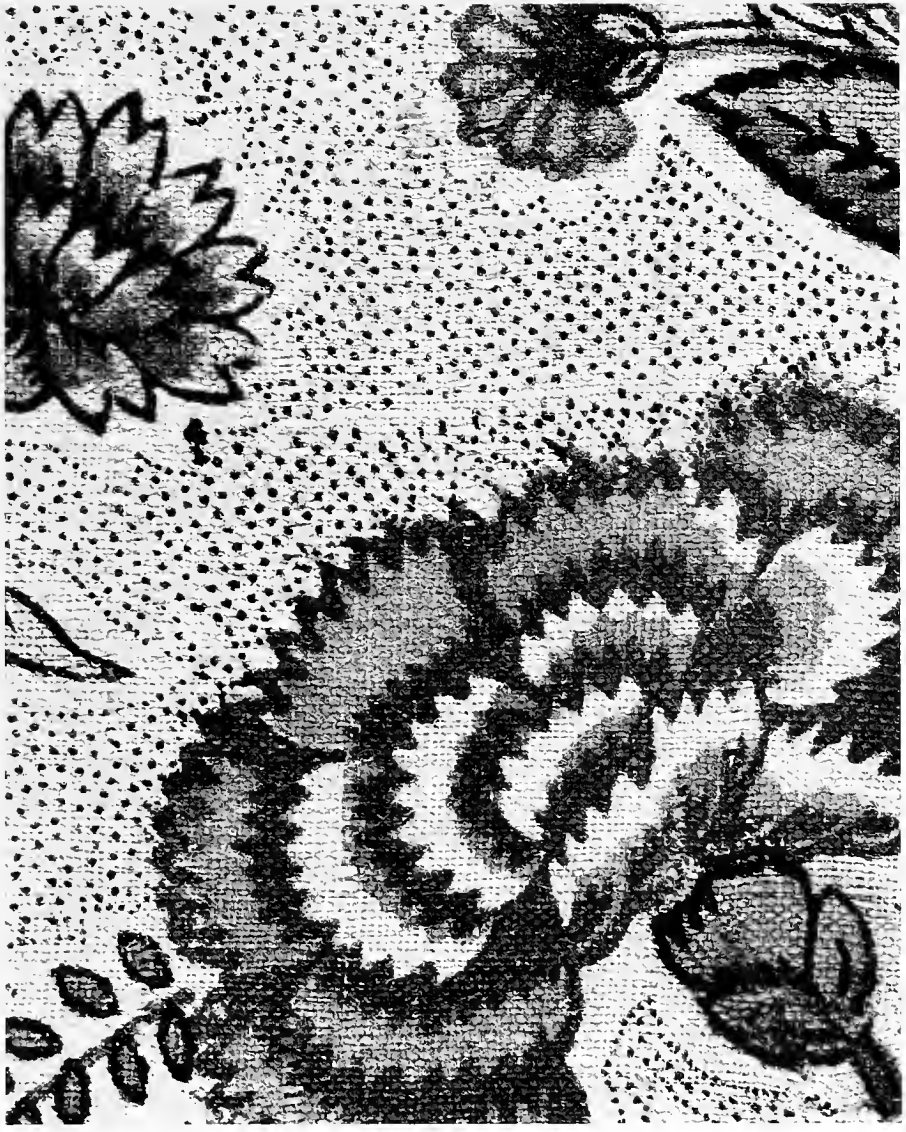


FIGURE 2

Block-printed fabric (detail on left)
Produced by the firm of Christophe-Philippe Oberkampf
Jouy, France, 1770–80
Plain-weave with linen warp, cotton weft
Height of repeat, 26.5 cm.
Gift of Josephine Howell
1973–51–101

The horizontal "seam," or white space, above the large flower in the detail indicates the edge of the printing block; several overprinted registration marks are visible as well.

FIGURE 3

Block-printed fabric
England, c. 1780
Plain-weave cotton
Height of repeat: 84.5 cm.
Purchased in memory of
Mrs. John Innes Kane
1953-19-3

European textile printers as well. Since cotton couldn't be grown in quantity in a northern climate, printers had to import undyed cotton cloth from India and various Mediterranean countries. Not until well into the second half of the eighteenth century did Europeans develop the ability to spin cotton fiber into a thread strong enough to serve as the warp in an all-cotton fabric. Prior to that, European printers sometimes used a cloth woven in Europe with a linen warp and a cotton weft, linen being grown in Europe and readily available. These linen-cotton fabrics were known as fustians in England and *siamoises* in France, although both of these terms were also used for other fabrics. Fabrics of mixed fibers were not as satisfactory for dyeing as all-cotton Indian cloth, however, because of the thickness of the fibers and because the linen and cotton threads did not take the dye equally.

Any discussion of textile printing techniques must begin with dyes and their technology, for it is the dye that gives the fabric its color. Most early dyes were derived from plants, although some of the more brilliant colors were produced by insects and shellfish. We know from rare examples of unused fabric from the eighteenth century that many colors were strong and bright, and not at all the muted shades now seen on faded and worn fabrics from the period. Dye chemists worked throughout the eighteenth century to isolate and create new colors, many of them from mineral bases, as well as to improve techniques for working with existing vegetable dyes. In 1797, the French chemist Louis Vaquelin (1763–1829) isolated chromium, which led to the further development of a range of strong, bright, new colors in the first half of the nineteenth century.

In order to be colorfast on linen or cotton, many dyes must be used in conjunction with a mordant, an agent that causes the dye to form a chemical bond with the fiber. Used alone, the dyes wash out. In the eighteenth century it was the mordant, not the dye, that was printed as a pattern on the cloth. The entire length of fabric was then immersed in the dye, and a colorfast bond was formed where the dye came in contact with the mordant. Finally, the color was cleared, or washed, from all non-mordanted areas.

Many natural dyes are capable of yielding several colors and shades depending on the mordant with which they are used. The madder plant, a member of the *Rubia* family, yields an enormous range of color—black, purples, browns, and both

FIGURE 4

Block-printed fabric
Produced by the firm of
Christophe-Philippe
Oberkampf
Jouy, France, c. 1775
Plain-weave cotton
Height of offset repeat:
64.8 cm.
Gift of Josephine Howell
1973-51-105

Oberkampf used printing blocks to imitate Indian hand-painting, employing a number of small blocks for this elaborate design.

bright and dull reds. The dye itself is no different for any of these colors, only the mordant is changed; for instance, an iron mordant and a madder dye will yield black, while an alum mordant with madder will yield red. By printing several mordants sequentially on a cloth before immersion dyeing, one madder bath will produce a multicolored fabric. Madder was such an important dye that it was raised commercially on farms, and specialists could distinguish between the madder grown in the Netherlands and that grown in the Mediterranean area.

Dyes and mordants had been used for many centuries on piece goods and yarn before Europeans learned how to control mordants sufficiently to print with them. The problem was essentially one of thickening the liquid mordant so that it could be transferred from vat to cloth by means of a carved wooden block. The substance had to be thick enough to adhere to the block without running off, but thin enough so that the edges of the shapes could print a clear outline without blurring. Starch or

FIGURE 5

Block-printed border
Produced by the firm of Christophe-Philippe Oberkampf
Jouy, France, c. 1800
Plain-weave cotton
Length of repeat: 23.5 cm.
Gift of Josephine Howell
1973-51-138

FIGURE 6

Block-printed fabric
Produced by the firm of Christophe-Philippe Oberkampf
Jouy, France, c. 1795
Plain-weave cotton
Height of repeat: 39.4 cm.
Au Panier Fleuri Fund
1957-74-1

Typical of a group of fabrics produced by several firms in northern France at the end of the eighteenth century, this piece is printed with four different motifs, widely spaced but regularly repeated in horizontal rows.

flour was often used as a thickener, but the recipes for mordants and dyes were developed by individual printers and varied considerably from one firm to another.

After a fabric had been printed and the excess color cleared, it was often glazed, a finishing technique that gave a lustrous and shiny surface. The glaze usually washed off, but occasionally an unused example from the eighteenth century can be found with the glaze still intact.

Textile-printing techniques fall into four major categories: block printing, plate printing, roller printing, and lithography. Each of these techniques leaves a different sort of impression and gives the cloth a different appearance.

BLOCK PRINTING

*B*lock printing was the most common textile-printing technique in Europe until early in the nineteenth century. Hand-held wooden blocks carved with designs in relief were used to print a repetition of a design along a length of fabric. Since each block could print only one mordant or color, each color required another block. Fabrics with many colors were produced with a large number of printing blocks, each containing only that part of the overall design it was to print.

Although block sizes varied widely, and shapes ranged from square to rectangular to irregular, the most common block was a rectangle of twenty to twenty-five centimeters by twenty-eight to thirty centimeters. Those blocks that printed only small areas of accent color might have a width of five centimeters or less. Given the practicalities of production, each block needed to be large enough to contain as much of the design as possible, yet small enough to be easily handled by printers and assistants.

Sometimes the wooden blocks were modified in order to produce special effects. Strips of metal, usually brass or copper, were hammered into the block to create narrow printing lines and to outline shapes, while closely set short lengths of wire were embedded in the block and filed off to the same height to produce a dotted impression known as picotage, or pin-work.

A technique called felting was introduced for printing large areas of solid color. Since wood does not hold the liquid dyeing medium evenly, often the wooden centers of what were to be areas of color larger than three-quarters of a centimeter were carved out and filled with tightly packed felt, which absorbs liquid and redeposits it evenly on the cloth. Sometimes felted areas left an impression on the back of the cloth that indicated both the wooden outline wall and the felted area of the block.

The precise placement of each block within the design for the final printed image was guided by a registration mark on the block *(FIGURE 2)*. A metal wire extending out from one corner of each block printed a small dot on the cloth. This registration mark was aligned with the dot on the corner of the succeeding impression. Printers, caught between the necessity of using registration marks and the desire to disguise them from the general public, often hid the dots within the seeded center of a flower or within a group of berries.

To print a length of cloth, impressions of a block were repeated regularly over the length and width of

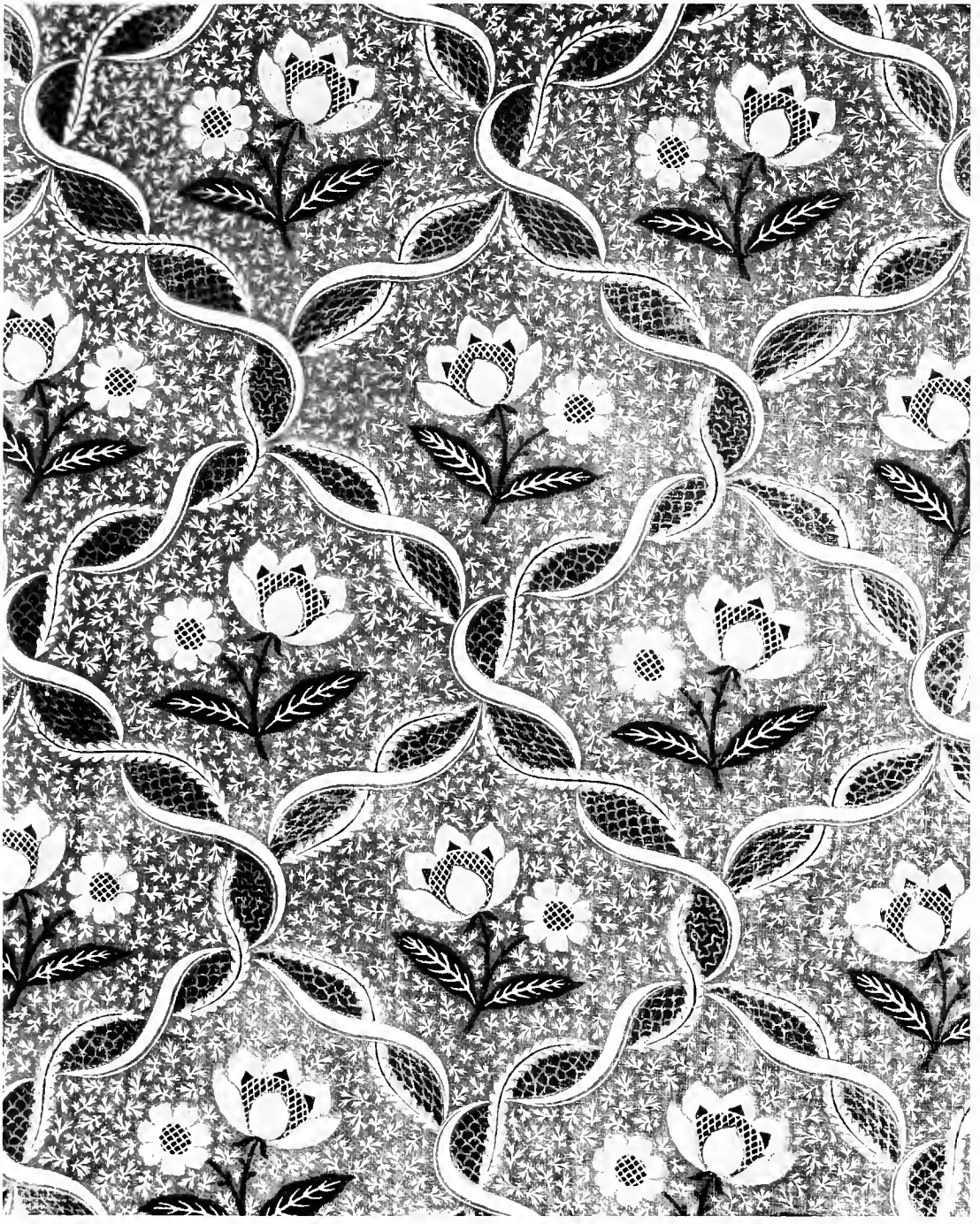


FIGURE 7

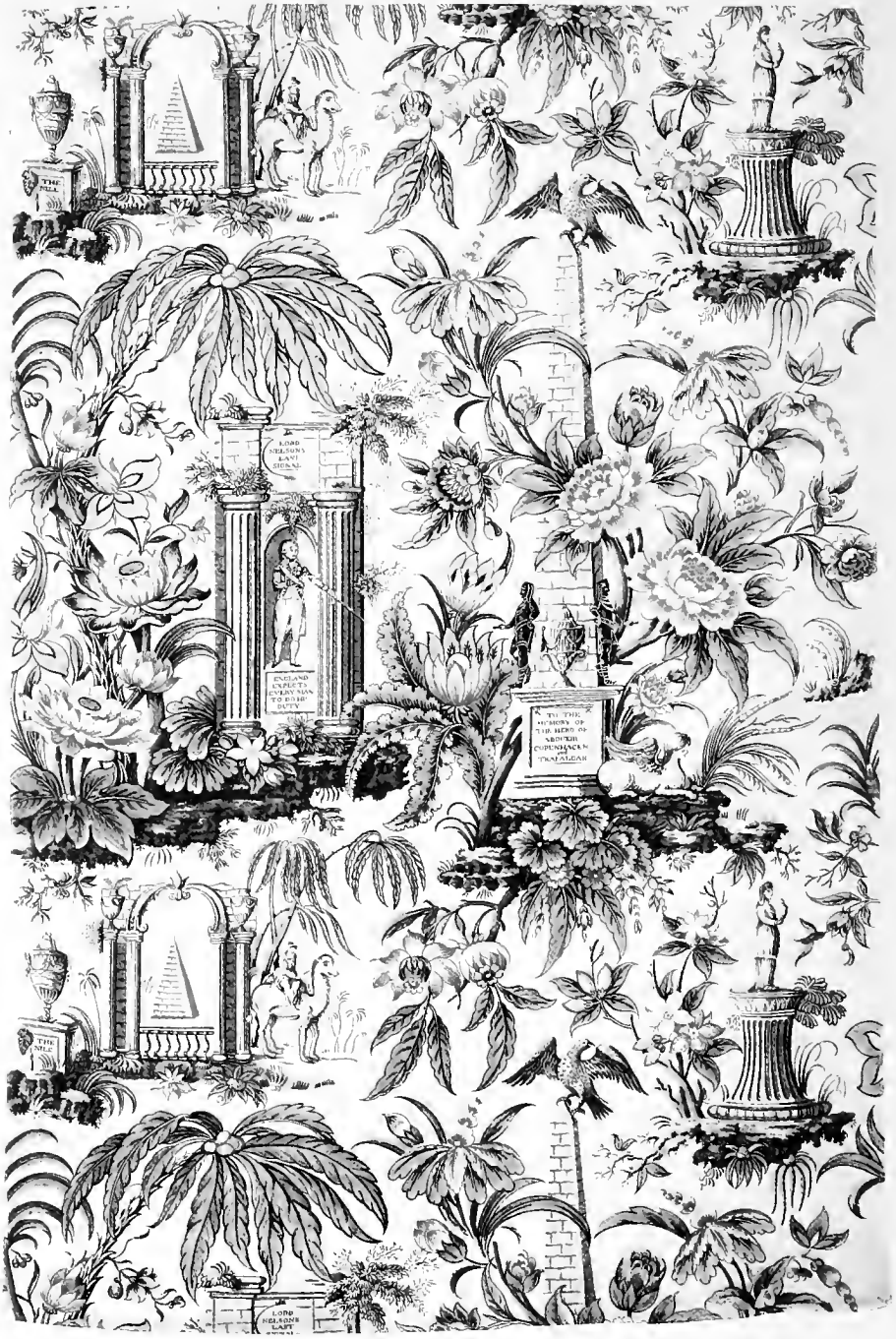
Block-printed fabric
France, 1785–95
Plain-weave cotton
Height of repeat: 24 cm.
Museum purchase
1985–6–1

This is a very good reproduction of a fabric originally produced by Oberkampf at Jouy. The flowers on the Jouy fabric are veined with lines; here the shading is achieved with scattered dots.

FIGURE 8

Block-printed fabric,
"Trafalgar Chintz"
Produced by the firm of
John Bury
Sabden, England, 1806
Plain-weave cotton
Height of repeat: 91.5 cm.
Gift of
Mrs. Roger Brunschwig
1966–32–1

This elaborate fabric was produced to commemorate the death of Admiral Lord Nelson in January 1806. Requiring many blocks to print, it was designed so that lengths placed side by side would form an offset repeat.



the entire fabric. If the block was lined up so that the impression it left was directly underneath and directly beside the impression of previous units, a straight repeat of the pattern resulted; if, instead, the block was printed partway down the side of the previous impression, an offset pattern resulted. The offset rhythm was frequently used in textile printing to disguise the joins of the printing unit.

The use of designs with strong diagonal movement helped disguise the printing unit, too. It is interesting to note how often block-printed fabrics are designed with diagonal vines or stems, although the printing is based on a vertical repetition of the block. To the informed eye, the block units are always discernible; spotting the registration marks is often the first step to determining the printing unit.

Block printers generally worked in teams during the eighteenth century, each printer with his own assistant, usually a young boy whose job it was to prepare the blocks between impressions. These assistants carefully dipped blocks into tubs of color, making certain that the colorant remained on top of the printing surface and did not run into the carved crevices. The printer in turn carefully aligned the block with the previous impression and hammered on its back with a mallet to drive the impression

FIGURE 9

Block-printed fabric
England, c. 1805
Plain-weave cotton
Height of offset repeat: 28 cm.
Gift of Harvey Smith
1959-91-2

This amusing fabric was created during a brief Egyptian revival period at the turn of the eighteenth century.

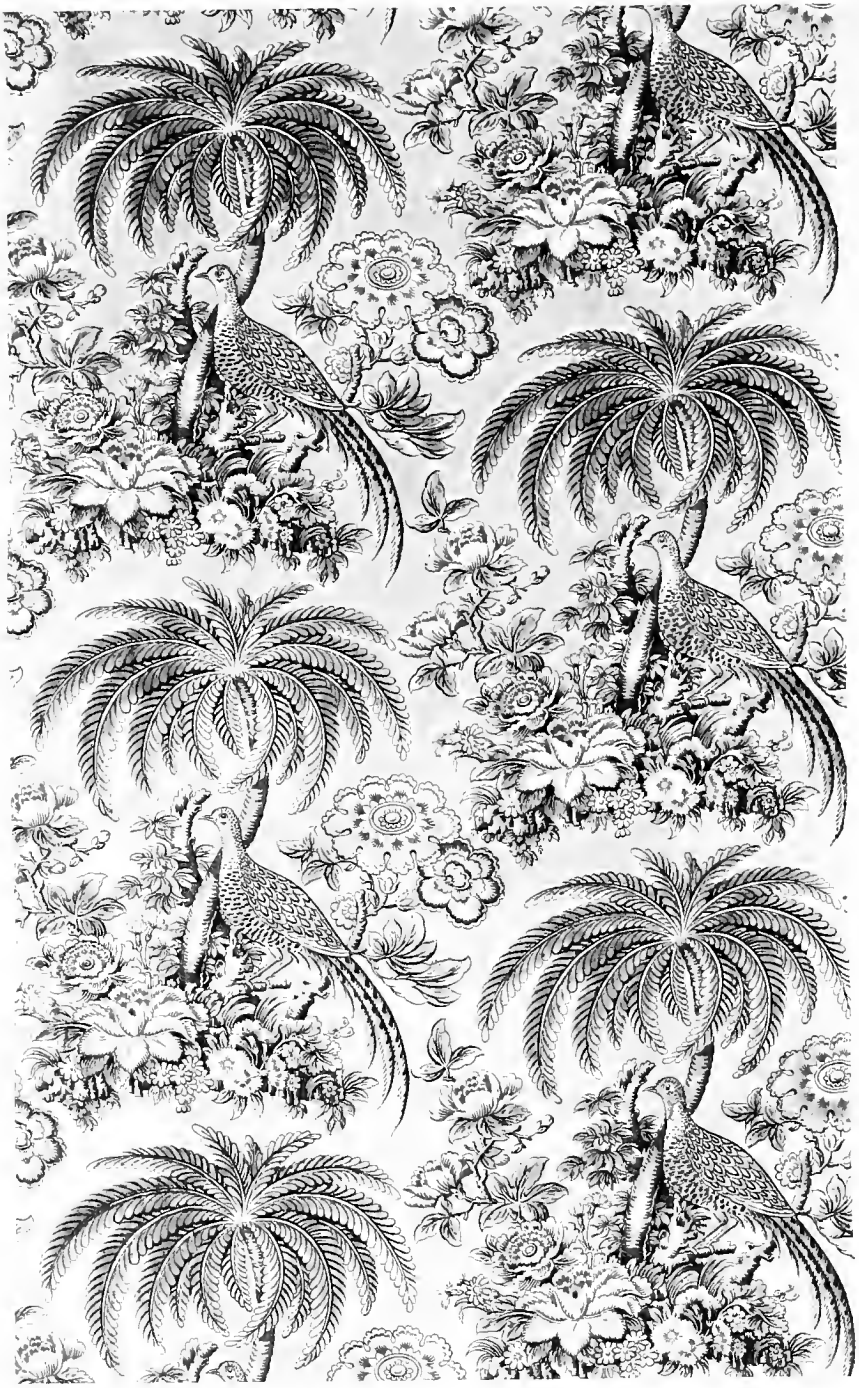


FIGURE 10

Block-printed fabric
Produced by Bannister Hall printworks
Lancashire, England, 1815
Plain-weave cotton
Height of offset repeat: 41.25 cm.
Gift of Clifton S. Billings
1971–79–2

home. Since each block could only print one mordant or color, each color required another block. A length of cloth was completely printed in one color before the printers started with the second color. The more colors a block-printed fabric displayed, the more highly it was prized both aesthetically and commercially.

Because printers purchased both domestic and imported cloths from different sources, the widths of unprinted material varied from lot to lot, causing designs planned for one width of cloth not to fit within the selvedges of another. In the best of the block-printed fabrics the edge-to-edge repeat was planned, and the purchaser was expected to sew lengths together as either an offset or a straight repeat, following the visual flow of the design. Blocks were often cut so that an image that was split on the block would be complete when lengths were seamed together *(FIGURE 8)*.

Block printing developed throughout Europe and even reached America, although until the nineteenth century American production was limited and of uneven quality. In each area where the industry took root, a characteristic style developed as well. For example, many English eighteenth-century block-printed fabrics have a spray of flowers entering the fabric horizontally from one edge, a design device that can be traced to the English silks woven at Spitalfields in the first half of the eighteenth century.

Several printing centers in France—at Jouy, in Alsace, and in Provence—produced a design that massed small flowers known as "mignonettes" or "bonnes herbes" on a dark ground. French textile printers frequently made an effort to have their fabrics look "Indian" *(FIGURE 4)* and incorporated strong and exotic plant forms in vivid coloring far more frequently than the English.

Christophe-Philippe Oberkampf (1738–1815) was the best known of the French printers. Although the term *toile de Jouy* is often thought to refer only to monochrome, copperplate-printed fabrics patterned with isolated motifs or scenes, Oberkampf began printing with blocks in 1759 when he opened his firm in Jouy. In business until 1842, his firm used the techniques of block printing, plate printing, and roller printing.

COPPER-PLATE PRINTING

The use of engraved sheets of metal for printing ink on paper, and occasionally on woven fabrics, developed in Europe as early as the fifteenth century. Not until the early 1750s in Ireland were engraved sheets or plates used to print continuous lengths of fabric with a mordant, followed with immersion dyeing of the mordanted textile.

Copperplate printing requires a colorant of a different consistency from that of block printing because the viscosity demanded by an intaglio or engraved surface is quite different from that of a relief or raised surface. Copperplate printing presses consisted of a flat-bed frame on which the plate, with a mordant in its incised lines, was placed face up. The fabric to be printed was laid on top and pressed so closely to the plate, by means of a winch and mangle, that the fabric absorbed the liquid mordant resting in the incised lines of the plate. When a continuous length of cloth was being printed, the plate was recolored and the cloth repositioned after each impression.

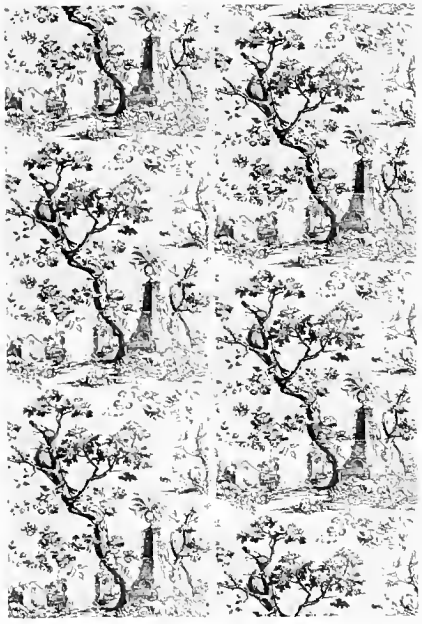
The height of the repeat in copperplate printing was generally from eighty-four to one hundred and four centimeters. If two different plates were printed sequentially, as was done by an English printer named Robert Jones, followed by a group of Alsatian printers, the height of the repeat could reach up to two meters. Perhaps the size of the repeat inspired the frequent choice of architectural elements in the design. Obviously, their height limited the uses of the fabric; large-scale patterns could only be used for interior decorations.

The fineness of the engraved line used in copperplate printing meant that the images designed for textile printing could be moré detailed and realistic. Flower petals could be rendered with depth and clarity, and human figures depicted with the modeling that suggests real flesh. Unfortunately, as successive impressions were taken from the same plate, the metal wore away, and the sharp-edged line of the printing plate was gradually lost. A blurred, smudgy look indicates a late impression.

Francis Nixon, working in the Dublin suburb of Drumcondra between 1751 and 1755, produced a design of surprising sophistication for what is presumed to be the first copperplate-printed cotton textile with a repeating design *(FIGURE 11)*. The design of Nixon's Drumcondra fabric repeats vertically with no quickly discernible plate break line, the plate having been engraved so that elements at the top and bottom overlapped during the printing

FIGURE 11

Plate-printed fabric
(photographic
reconstruction of
lengths in repeat, below)
Produced by Francis Nixon
Drumcondra, Ireland,
1752–55
Plain-weave with linen warp,
cotton weft
Height of repeat: 99 cm.
Gift of
Elizabeth M. Holohan
1974–31–1



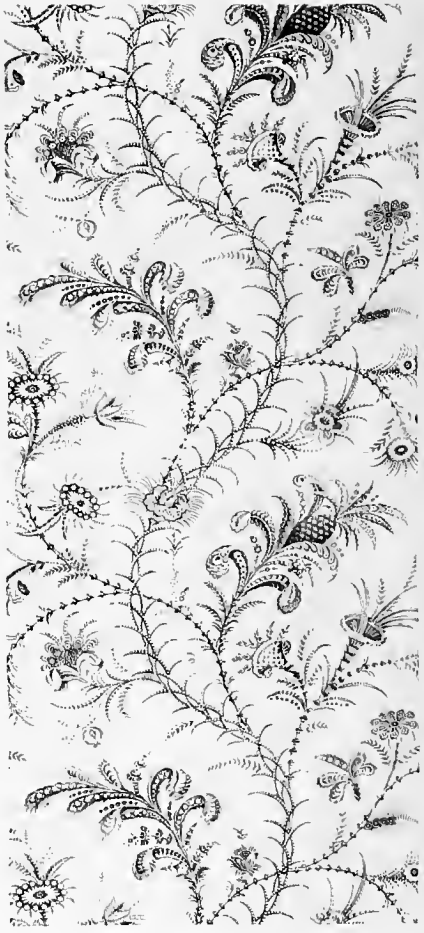
process. Furthermore, the design—a tree and architectural elements with a subsidiary motif of a rustic cottage—was not centered on the plate but arranged with parts of the pattern coming in from each edge. If lengths of the printed fabric were sewn together, the design would form an offset repeat.

Copperplate-printed textiles quickly became fashionable in Britain, and by the 1760s several firms were engaged in their production. Nixon left Ireland between 1755 and 1757 and became a partner in an English firm located on the River Merton. In addition, John and Mary Ware at Crayford, Robert Jones at Old Ford, the Ollive, Talwin and Foster families at Bromley Hall, and several other firms were involved in copperplate printing. Some of these firms produced designs that have a distinctive "look." For example, the Wares produced a rare category of fabrics printed by two plates, the second plate printed on top of the impression of the first.

The attention English manufacturers paid to the design of edge-to-edge repeats varied widely. The Nixon and the Jones firms, for example, produced lengths of fabrics that were clearly intended to be sewn together as offset repeats when assembled as curtains or hangings. Usually part of a motif was printed on each edge of the fabric. On the other hand, designs produced by the Ollive, Talwin, and Foster families at the Bromley Hall printworks recurved towards the center or tapered to a complete stop rather than reaching across the edge of the fabric *(FIGURE 12)*.

After 1774, British law required printers to use all-cotton fabrics of British manufacture and stipulated that these fabrics be woven with blue warps at the edges. Today these warps help identify a printed fabric as British and pinpoint its production between 1774 and 1811. Many of these blue-warp, copperplate-printed fabrics have a width of about sixty-eight centimeters, as opposed to a width of around one hundred and four centimeters for fabrics printed before 1774. Despite this change, printers often appear to have continued to use plates originally designed for larger cloth. The result, of course, was that pre-1774 designs printed on later, blue-warped fabric were lopped off, sometimes in mid-image, losing from twenty-five to thirty-eight centimeters of the design *(FIGURE 13)*.

England was also responsible for a small but puzzling group of white on blue prints, the designs of which correspond to recorded examples from the Bromley Hall printworks



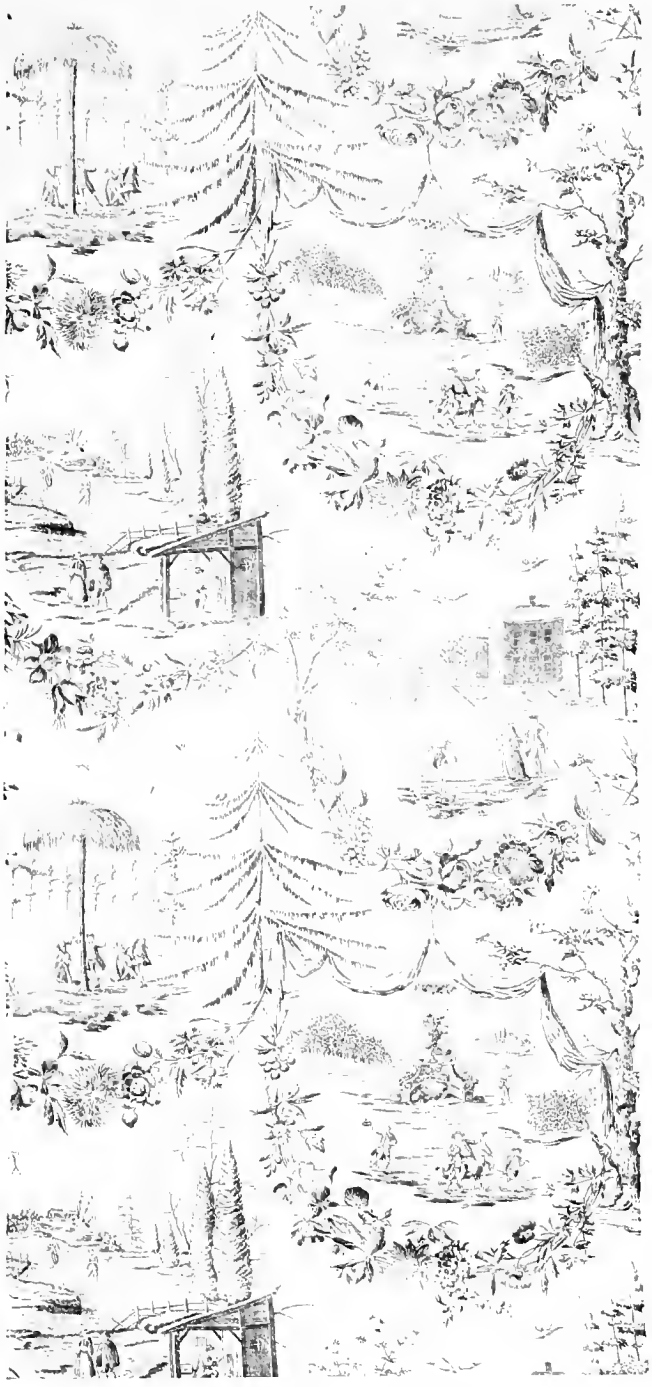


FIGURE 12

Plate-printed fabric
Produced by the firm of
Bromley Hall
Middlesex, England; design
c. 1760, printing after 1774
Plain-weave cotton
Height of repeat: 87.60 cm.
Au Panier Fleuri Fund
1960–5–1

The fabric on which this late impression was printed is narrower than the design itself and the printing plate. Blue warps at each edge indicate that the fabric was woven in England sometime after 1774.

FIGURE 13

Plate-printed fabric
England, c. 1770
Plain-weave with linen warp,
cotton weft
Height of repeat: 95.25 cm.
Museum purchase
1984–123–1

The motifs here have been cut off abruptly at the edges, for the fabric is too narrow for the printing plate.

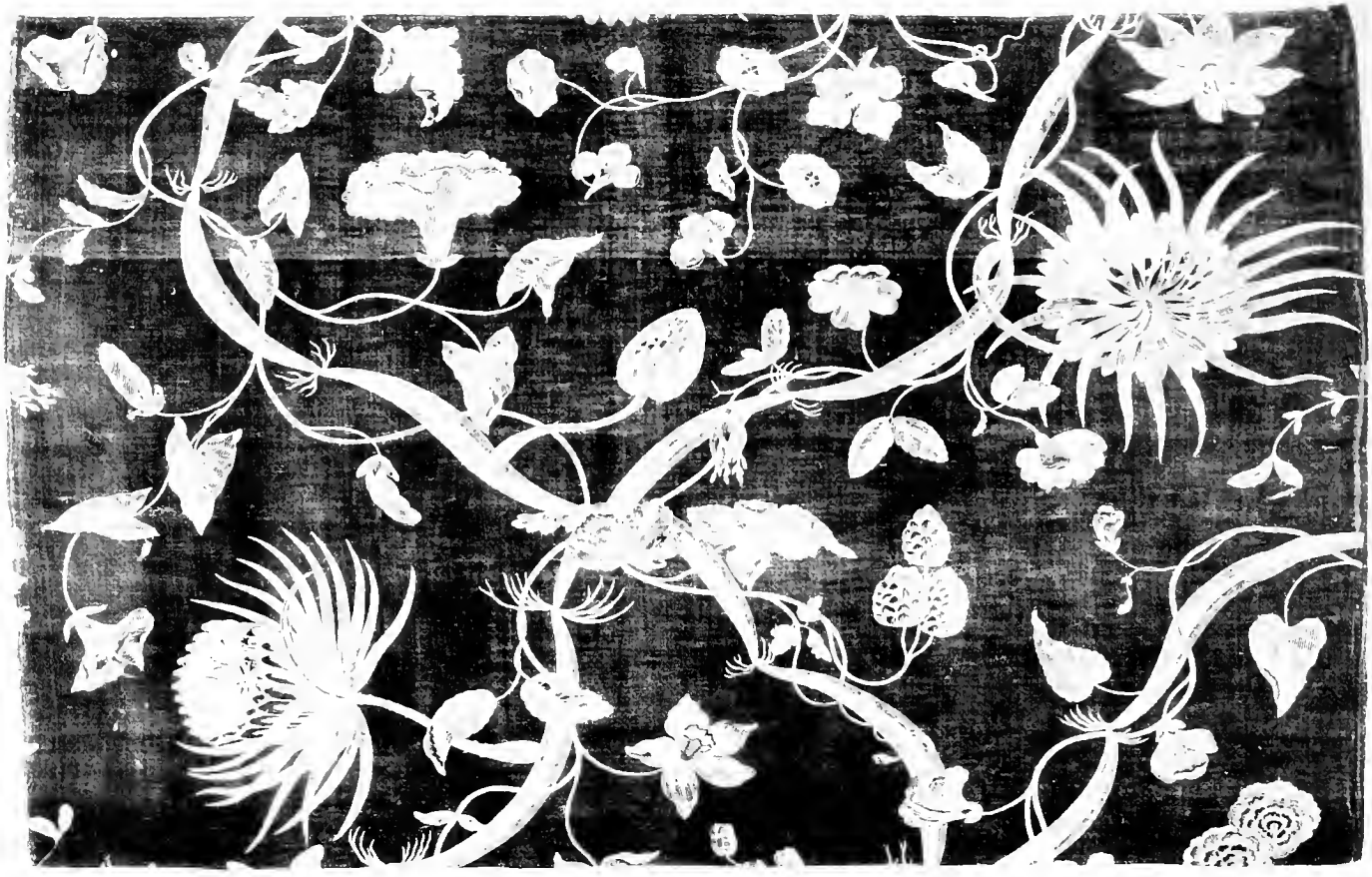


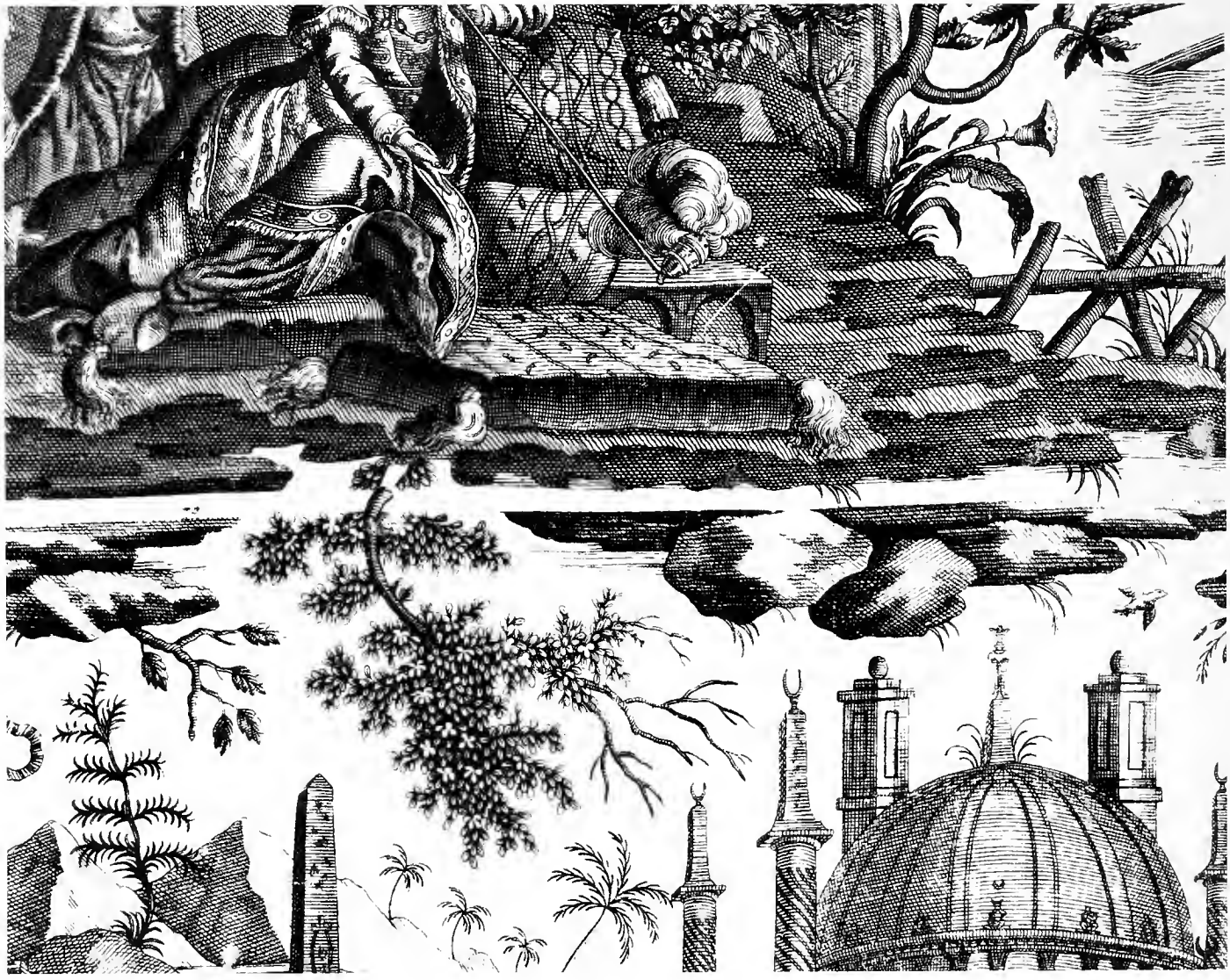
FIGURE 14

Indigo-dyed fabric,
plate-printed with
discharging or bleaching
agent
Produced by the firm of
Bromley Hall
Middlesex, England, 1790s
Plain-weave cotton
58.5 x 91.5 cm.
Gift of Harold M. Bailey
1960–79–20

FIGURE 15

Plate-printed fabric
Designed by Jean Baptiste Huet (1745–1811), after Jean Baptiste Oudry (1686–1755)
Produced by the firm of Christophe-Philippe Oberkampf
Jouy, France, 1806
Plain-weave cotton
Height of repeat: 96.5 cm.
Museum purchase
1980–33–9

This textile is representative of the best copperplate work printed by Oberkampf. Consistently the firm designed its plates at least an inch narrower than the fabrics to allow for a seam when lengths were sewn together. The design then formed an offset repeat.



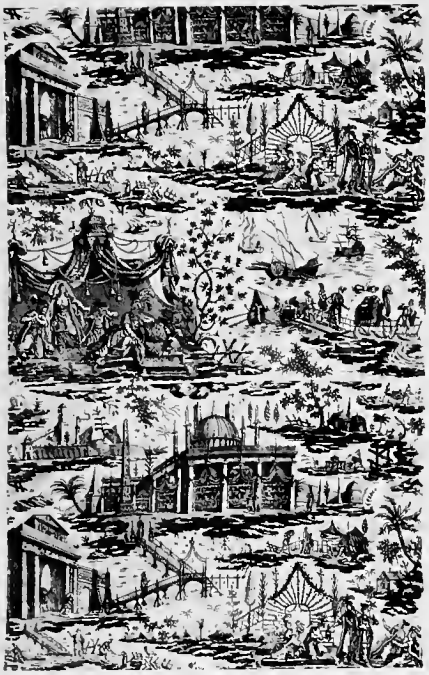


FIGURE 16

Plate-printed fabric,
"Cairo Fair" (detail
opposite)
Produced by the firm of
Petitpierre & Cie
Nantes, France, c. 1800
Plain-weave cotton
Height of repeat: 99 cm.
Gift of W. & J. Sloane
1943–43–27

The white band running horizontally through the center of the detail shows a misregistration of the plate. The manufacturer tried to disguise the plate line by having parts of the design—a branch and small leaves—extend above and below the plate break line.

(FIGURE 14). Their production reversed the usual process by first dyeing the cloth a solid indigo and then creating the design by plate-printing a bleaching or color discharging agent.

French production of copperplate-printed fabrics began in the 1770s in response to England's successes. The French quickly excelled at the technique, and by the 1790s their designs surpassed those of the English.

Christophe-Philippe Oberkampf's firm at Jouy began to produce copperplate as well as block-printed textiles. The first copperplates employed at Jouy were designed to print all the way to the edge of the fabric. If lengths were sewn up, part of the design was lost in the seam. Within a few years, the printers began to leave almost an inch of unprinted white space at each edge. This unprinted white border became a convention of French copperplate-printed textiles. Many of the later monochrome plate-printed fabrics were designed by Jean-Baptiste Huet (1745–1811), a Parisian painter whom Oberkampf had secured as a textile designer *(FIGURE 15).* Huet's chief skill lay in designing scenes with animals and people.

The city of Nantes, a seaport in northwestern France, was one of the most important textile-printing centers in Europe. Several major firms in the city produced copperplate-printed fabrics, among them Favre Petitpierre & Cie *(FIGURE 16).* Gorgerat, and Dubern & Cie. To some extent, Nantes' thriving textile business can be explained by the city's extensive overseas trade. The city's textile printers could readily import raw goods and supplies, and just as easily export printed cloth. Printed textiles of all sorts formed one of the city's most important export commodities.

In some instances it is difficult to determine which firm produced a particular plate-printed textile. The designs of at least one Nantes firm, Favre Petitpierre & Cie, are sometimes found with the name of another firm, such as La Fosse Lionell of Montpelier, printed on the cloth. Either Favre Pepitpierre printed on contract for other firms, or they sold their plates to competitors in other parts of France after they had finished with them.

This latter hypothesis is further supported by the existence of five engraved copper printing plates in the Musée Lambinet in Versailles, which essentially match designs known to have been produced by the Favre Petitpierre firm. In each case, however, some additions have been engraved onto the plate—more foliage, a flock of small birds, a striped background. These alterations were probably made after the plates left the Favre Petitpierre ownership.

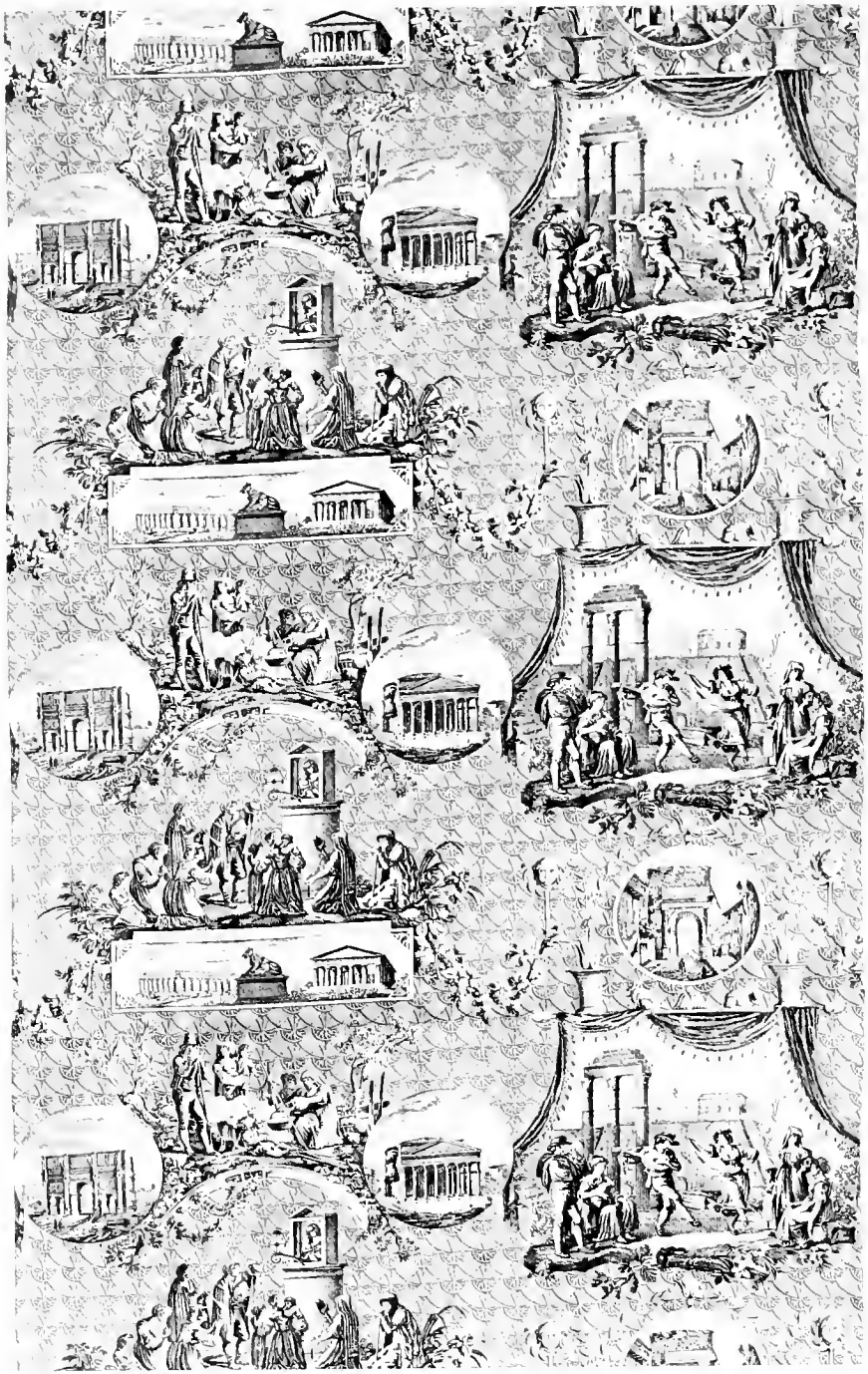


FIGURE 17

Engraved plate- and block-printed fabric, "Monuments of Rome"
Produced by the firm of Oberkampf and Widmer after designs by Bartolomeo Pinelli (1781–1835)
Jouy, France, c. 1821
Plain-weave cotton
Height of repeat: 52 cm.
Museum purchase
1978–140–4

During the nineteenth century the height of printing plates decreased somewhat, as this relatively small repeat illustrates.

ROLLER PRINTING

*E*ngraved plates and carved wooden blocks continued to be used for textile printing until well into the nineteenth century, but their importance steadily lessened with the move to engraved rollers or cylinders that began in the second half of the eighteenth century. The process, which Thomas Bell patented in 1783, was first successfully practiced in England.

The immediate advantages of roller printing in terms of rapid commercial production were remarkable, allowing for the mass production of printed textiles at a much lower cost to the consumer. The technique of roller printing involves a continuously rotating cylinder, which, on each revolution, comes in contact with both the color trough, for a fresh coloring, and the fabric. The fabric is thereby printed continuously from the start of the bolt to the end, as opposed to the block or plate system of repositioning and recoloring the printing element, as well as repositioning the fabric, between each impression. The design is positioned on the cylinder so that the top and the bottom of the motifs connect exactly. Unlike both plate- and block-printed fabrics, roller-printed fabrics show no sign of a mechanical repeat. The height of the repeat on early roller prints is short, for the repeat height corresponds to the circumference of the printing roller, and at first only rollers of narrow diameter were used. There was no repeat in the width of early monochrome roller prints.

Because the first roller-printing machines could produce only monochrome fabrics, English printers used them to print textiles that looked a lot like copperplate-printed textiles. The principal difference lay in the greater height of the repeat possible with copperplate-printed fabric.

Printing large areas of solid color presented a particular challenge in roller printing, one solved by engraving a series of closely spaced diagonal lines that, when printed, gave the effect of a solid block of color. These areas of color were often used as the background for the design. At other times a network of finely drawn, lace-like curves filled the background area.

Machines were soon made that could print several colors at the same time. The fabric passed through the machine once, coming in contact with a different cylinder for each color. The principal challenge in roller printing more than one color lay in keeping colors from running into each other. It was found that combining engraved cylinders with wooden rollers having a relief surface of wood, metal, and felt worked very well *(SEE COVER).* In England this

FIGURE 18

Roller-printed fabric
Produced by the firm of
Hausmann
Logelback, Alsace, c. 1840
Plain-weave cotton
Height of repeat: 43.2 cm.
Gift of W. & J. Sloane
1943–43–28

Although the roller used to print this piece was wider than the textile, it is apparent from the design that the fabric was intended to be sewn together as an offset repeat.

practice was called union, or mule, printing. If one examines such a textile, it is difficult to tell if the fabric was printed by a union press or printed first by engtaved cylinders with further colors added by hand-held wood blocks.

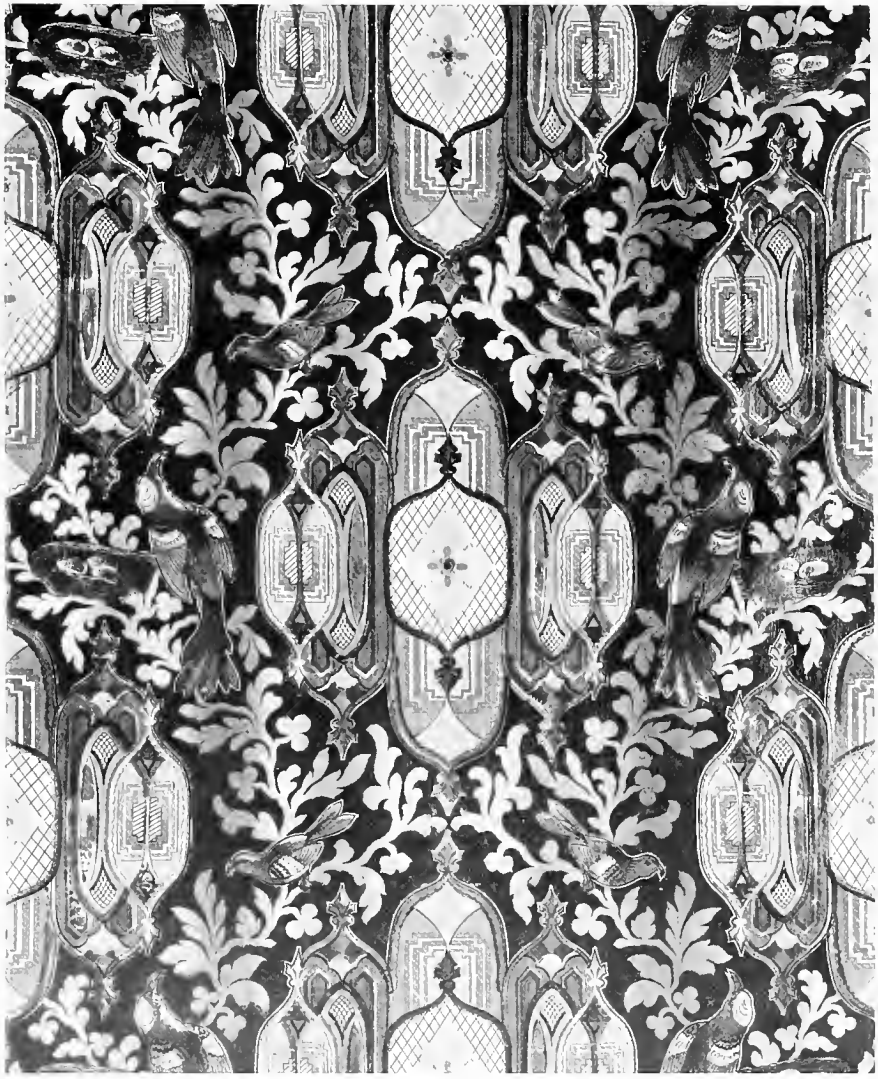
The selvedge-to-selvedge width of English roller-printed fabric from the early nineteenth century was only about sixty-three centimeters. Apparently many rollers had been made to print a wider fabric, for the design was cut off in mid-motif in such a manner that it could not match up with any patt of the design on the other edge. The patterns on curtains, large hangings, and bed-coverings, for instance, would have been continually interrupted. Nevertheless, printed fabrics, which were now available in greater quantity and at a lower cost, appealed to the mass market.

By the 1830s, roller-printed fabric

FIGURE 19

Roller-printed fabric
England, 1835–45
Plain-weave cotton
Height of repeat: 38.7 cm.
Museum purchase
1977–65–1

Shaded stripes of color were one of the innovations that roller printing produced.



was being produced in quantity in England and on the Continent. The cost per yard dropped to a point that was much lower than fifty years earlier when printing was done with blocks or plates, and a greater range of color was available because of improvements in new dyes, including a brilliant chrome yellow and a bright green. Green had always been a difficult color to achieve in the eighteenth century, since it necessitated printing yellow over blue.

Printers also began to use fabrics other than those made entirely of cotton. Wool took dye beautifully and served as a foundation for some highly colorful and exotic designs. Fabrics with a mixed fiber content such as those with a silk warp and a wool weft were also introduced, while cottons intended for more exclusive markets were woven with a design or texture in the fabric.

OTHER DEVELOPMENTS

Lithography was developed as a printing technique in Germany in the last decade of the eighteenth century. Useful primarily for printing on paper, its application to textile printing was limited. Lithography was not employed for lengths of cloth with repeating patterns, but instead for specially sized pieces such as handkerchiefs, sashes, men's waistcoats, and other specialized items that were not designed with a repeating pattern. The technique was effective on both cotton and silk foundation fabrics.

Lithography is often difficult to identify because the fibers of the foundation cloth have absorbed enough of the printing pigment so that the technique may be confused with stipple engraving or even etching, both of which were also occasionally used for textile printing. Only the word *litho* next to the printer's name identifies the technique with certainty.

In the first half of the nineteenth century, European printers used blocks, plates, rollers, and lithography to create the designs for their fabrics. Technological improvements came quickly. Roller-printing machines were developed that could print increasing numbers of colors, permitting the speedy production of very colorful textiles.

Great advances were also made during this period in a technique called discharge printing. By 1815 a substance had been developed that could remove color from dyed cloth and at the same time deposit a metallic oxide that served as a mordant for yet another color. It thus became possible to print a yellow design on a red background with no intervening space between the two colors.

Another development combined a resist with a mordant, creating a type of fabric known as lapis, after the gemstone lapis lazuli, in which flecks of many colors can be seen. Lapis fabrics are characterized by a number of different colors in small areas, usually including red, yellow, black, blue, and green. Lapis involved printing a substance that was at once both a mordant for the red dye and a resist for the blue. Thus when a lapis fabric was immersion dyed in madder, then immersion dyed in indigo, the blue and the red color appeared only in the preselected areas. Lapis was a technique that began in England and was further developed in Alsace.

The development of the printed textile industry between 1760 and the mid-nineteenth century was extraordinarily rapid. In England, with no more than forty thousand persons

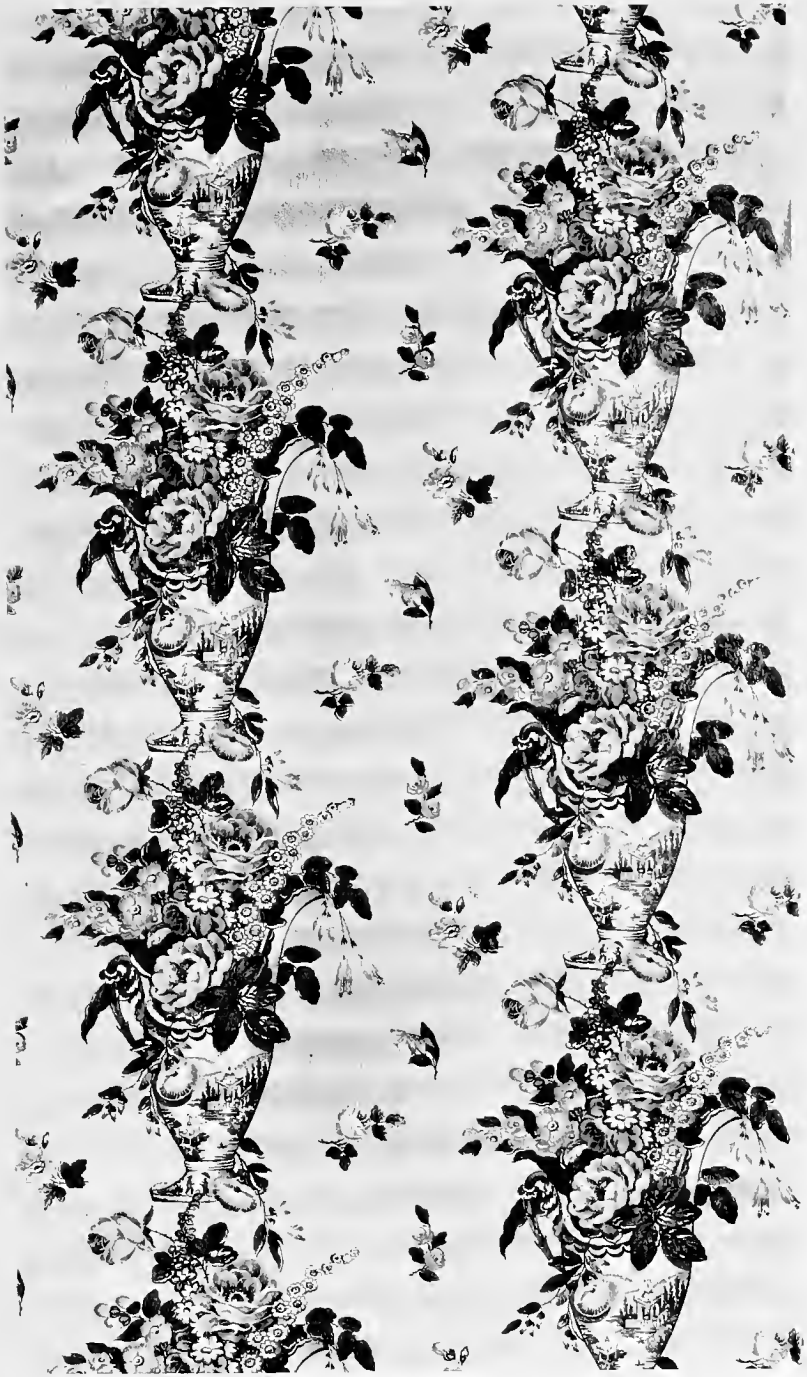
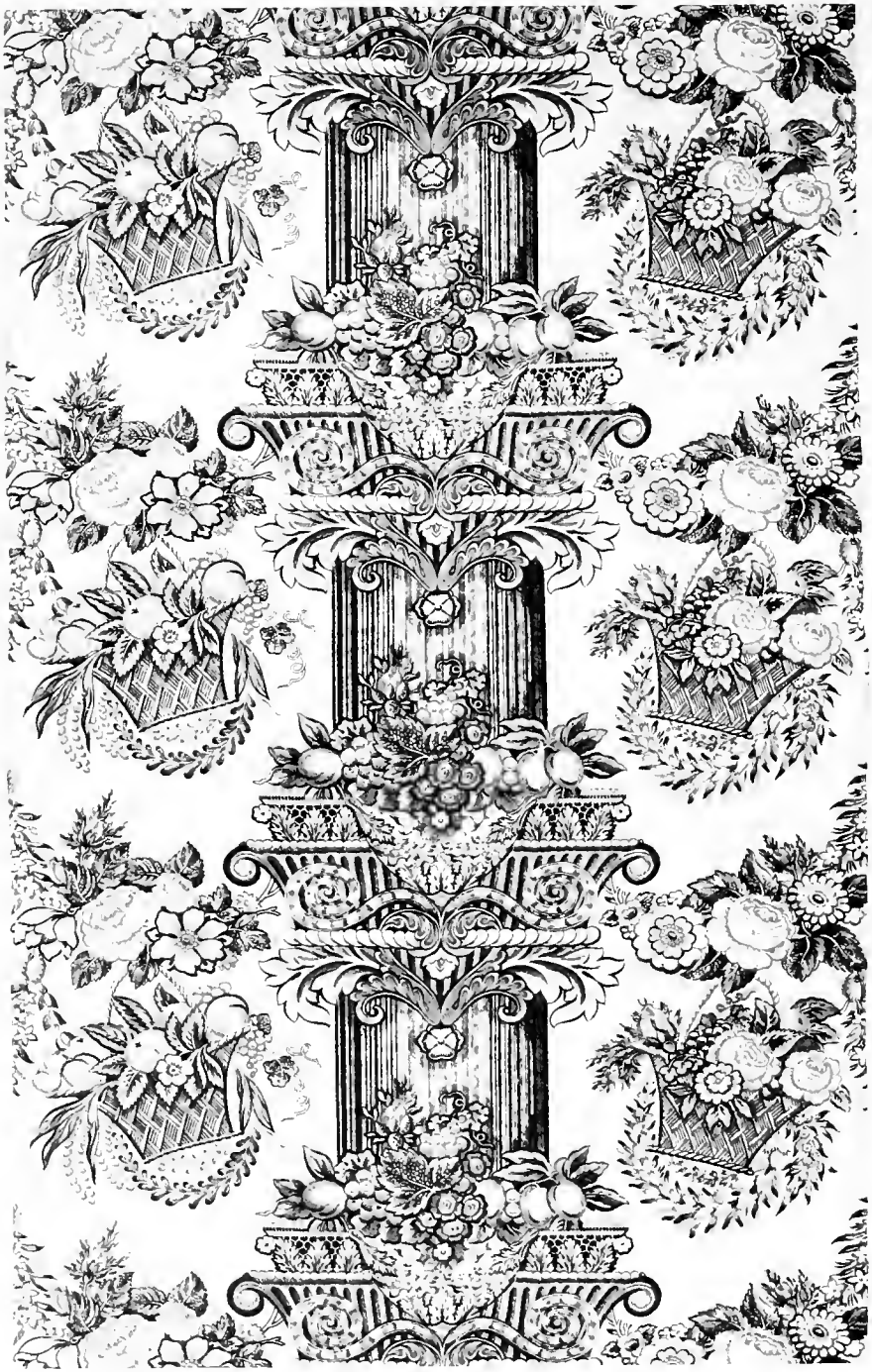


FIGURE 30

Roller-printed fabric
England, c. 1835
Plain-weave cotton
Height of repeat: 34.9 cm.
Au Panier Fleuri Fund
1986–74–1

This elaborate fabric was printed with both relief and engraved rollers, seven in all. The landscape on the urn illustrates the sophisticated control of shading that good roller printing could achieve.



employed in 1760, the industry grew to support a million and a half workers by 1835. Printed fabrics quickly lost their status as luxury goods for the wealthy and became everyday purchases for the middle and lower classes. Edward Baines, writing in 1835, described the situation in England: "...the humblest classes have now the means of as great neatness, and even gaiety of dress, as the middle and upper classes of the last age. A country-wake in the nineteenth century may display as much finery as a drawing room of the eighteenth; and the peasant's cottage...have as handsome furnitures [fabrics] for beds, windows and tables as those of a house of a substantial tradesman sixty years since."

This extraordinary turn of events

FIGURE 21

Roller-printed fabric
England, 1825–35
Plain-weave cotton
Height of repeat: 34.3 cm.
Gift of Mrs. Ralph P. Hanes
1987–167–3

This textile was printed by a machine called a mule, or union machine, which worked with both engraved and relief rollers.

was the outgrowth of a variety of factors, including the increasing availability of cotton, particularly from the American South, chemical discoveries, mechanical improvements in spinning, weaving, and printing, the caprices of fashion, and the politics of international trade. All over Europe the situation was much the same. Once the technology and resources for mass production became available, printed fabrics lost some of their novelty and their prestige. Not until the second half of the nineteenth century, with such developments as the manufacture of aniline dyes, the revival of block printing, and the discovery of screen printing, did printed cottons regain a degree of their former status.

Gillian Moss
Assistant Curator

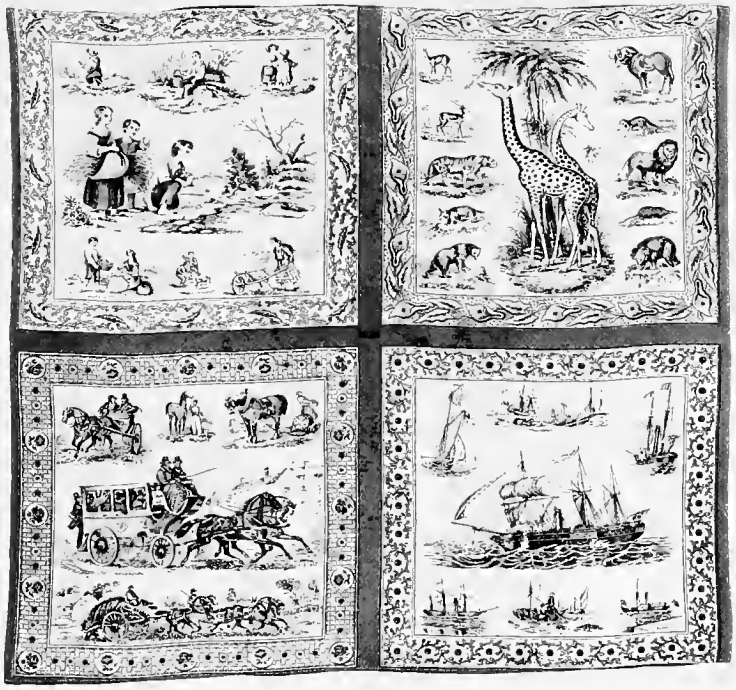


FIGURE 22

Plate-printed
handerkerchiefs
England, c. 1845
76.2 x 82.5 cm.
Gift of
Mrs. William A. Hutcheson
1943–31–8

The plate with which this fabric was printed contained the design for four small handerchiefs. The purchaser was expected to cut the handkerchiefs apart and hem them individually.

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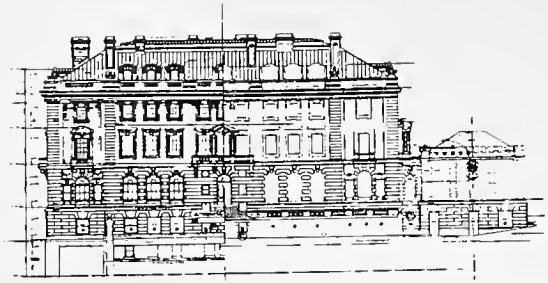

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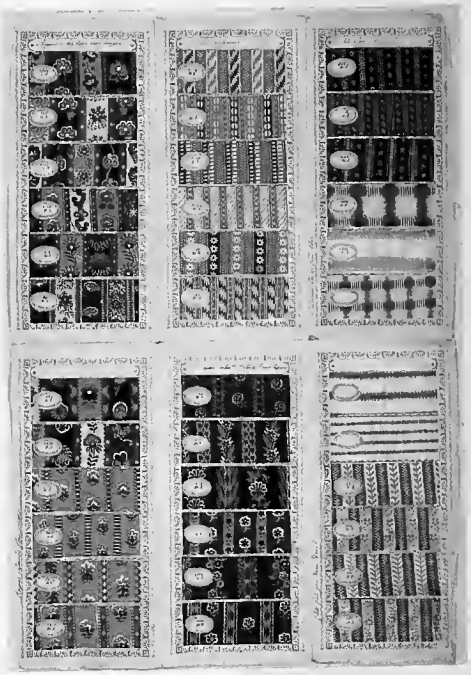

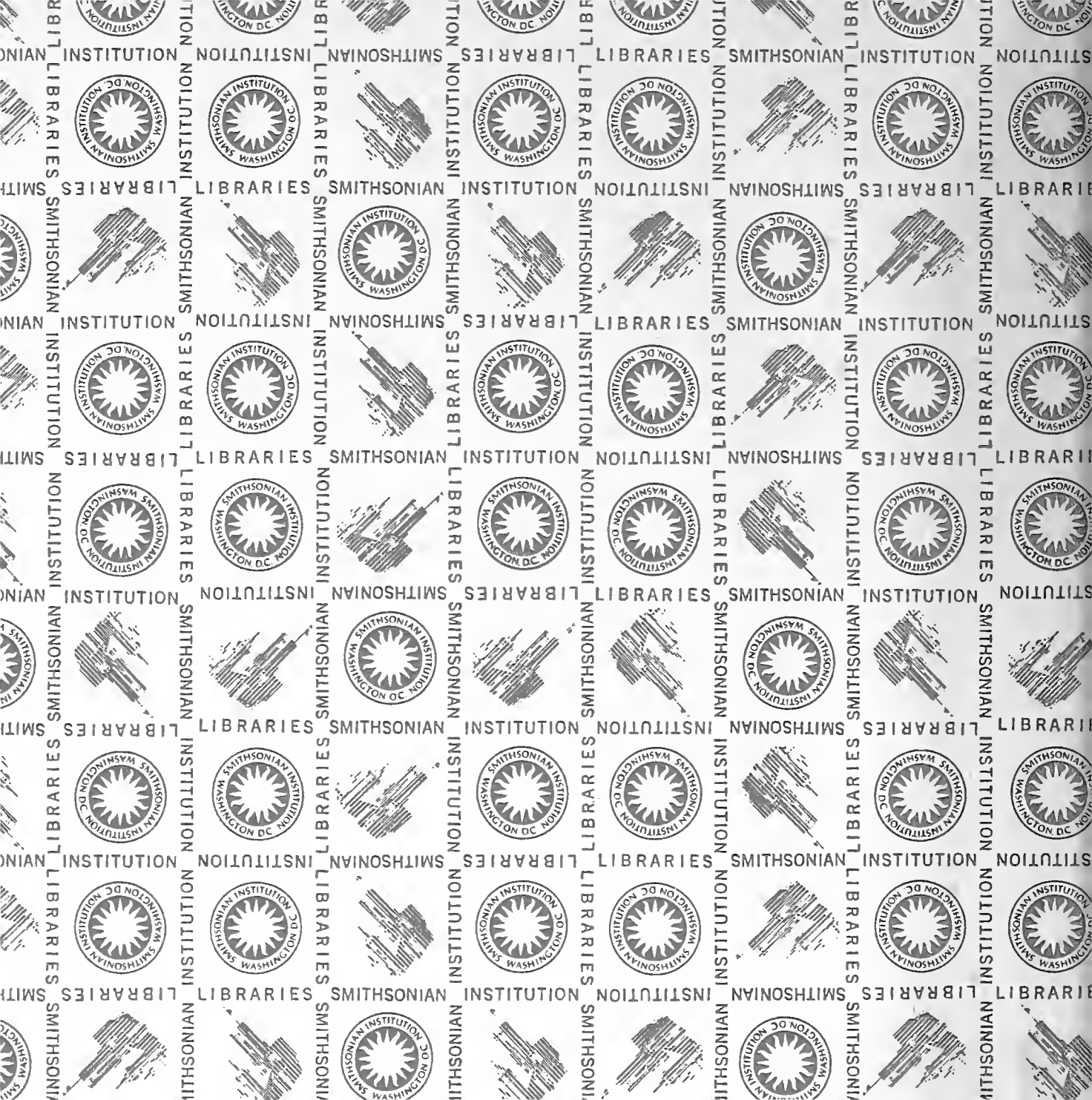
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